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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE: FORTY-FIFTH MEETING, BUFFALO, AUGUST 24-29, 1896.

THE fourth Buffalo meeting of the American Association for the Advancement of Science, began on Saturday, August 24th, 1896, with the meeting of the Council at noon, in the Iroquois Hotel, with rather more than usual of that body present. The first general session of the Association was held at 10 o'clock Monday, and the last at 8 o'clock on Friday evening.

On Tuesday evening a reception was given to the Association by the ladies of Buffalo in the rooms of the Twentieth Century Club. The Buffalo Club extended the privileges of its house to all members during the week. Thursday afternoon, August 27th, the Geologists were entertained at the Idlewood Club, at the mouth of 18-Mile Creek, a noted fossil collecting ground. On Friday, August 28th, the Botanists were taken ten miles up the Canadian lake shore to Point Abino, where the Section was the guests of the Point Abino Association. The grand trip of the session was a general complimentary excursion for the Association to Niagara Falls, on Saturday, August 29th.

The new arrangement as to time seems to have been generally satisfactory, and is decidedly advantageous in permitting the sections to have sessions for four full days without interruption. The attendance this year was not large, owing doubtless to the economy-provoking condition of political affairs. The registration was 330. 110 new members were elected and 83 members were elected fellows. Horatio Hale, of Clinton, Ont., upon nomination by Section H, was made a life fellow, and Wolcott Gibbs, Professor Emeritus in Harvard University, was elected an honorary fellow. Four foreign associates were elected: Victor Gutzu, of Bucharest, Roumania, sent by his government to investigate petroleum products; Seiryō Mine, of Japan, sent by

his government to investigate long distance transmission of electrical power; Miss Mary Foster, member of the Geological Society of London, and J. Bishop Tingle, of Aberdeen, Scotland.

Most of the officers of the Association were present. Vice-President Wm. E. Story, chairman of Section A, was detained by sickness in his family; the untimely death of Capt. John G. Bourke created a vacancy in the secretaryship of Section H, as did the journey to Greenland of Prof. A. C. Gill in that of Section E. Alex. Macfarlane, of South Bethlehem, Pa., was elected vice-president and chairman of Section A; Wm. North Rice and Geo. H. Perkins were elected secretaries of Sections E and H respectively.

The first session was called to order by the retiring president, Edward W. Morley, of Cleveland, who introduced the president-elect, Edw. D. Cope, of Philadelphia, who called upon Bishop Charles H. Fowler, D. D., to pronounce the invocation. The Association was welcomed by a brief address by Mayor Jewett, on behalf of the city, and by Dr. Roswell Park, President of the Buffalo Society of Natural Sciences, on behalf of that body. President Cope responded to the welcome and took occasion to speak of the characteristics of a scientific career. In the afternoon the eight addresses of the vice-presidents were delivered. These will be published in this JOURNAL. In the evening the address of the retiring president (published in the last number of this JOURNAL) was given before a large audience.

A communication regarding the metric system was referred to the Chairman of the Committee on Standards of Measurement, President T. C. Mendenhall. Later that committee presented the following report which was adopted :

Resolved, That the A. A. A. S. is now, as it always has been, earnestly in favor of reform in weights and measures, and it urges upon the Congress of the

United States the desirability of further legislation looking to the early adoption of the metric system.

Upon the subject of electrical standards the committee presented the following report which was adopted :

In view of the absence of any properly constructed and authenticated standards of electrical measurement prepared under the law of 1894, this committee recommends that it be authorized to construct such standards, and to pay in part the necessary expenses incident to this work, that the sum of \$50 be placed at the disposal of the committee from current funds of the Association in possession of the treasurer ; it being understood that any standards thus constructed or material so acquired shall remain the property of the A. A. A. S., until otherwise disposed of by the Council.

A communication from the Joint Commission of the Scientific Societies of Washington regarding the creation of the office of Director-in-Chief of the scientific divisions of the United States Department of Agriculture was referred to a committee which later presented the following report, adopted unanimously :

Your Committee has carefully considered the communication from the Joint Commission referred to, and has consulted sundry other papers sent on from Washington by persons interested in the movement in question. That there has been in Washington a movement towards the creation of such an office is probably familiar to all the members of the Council. The Committee is informed that a circular letter from the Secretary of Agriculture has been sent to many of the members of the Council, and an editorial in *SCIENCE* has probably familiarized others with the matter. The Department of Agriculture has further been in correspondence with many scientific organizations in the country which could be regularly reached, and all have expressed themselves as favoring the plan.

In brief, the plan is the outgrowth of the unsatisfactory condition of affairs which has existed in the Department of Agriculture for some years, in fact since the great development of its scientific work which has taken place within the last decade. The officer having immediate supervision of the scientific divisions is the Assistant Secretary of Agriculture. This office is filled by Presidential appointment for a term of four years, and it has been found by experience that it takes the person appointed to fill this office about one year to familiarize himself with the details of the work, and that no sooner does he be-

come thoroughly acquainted with the conditions than his term of office expires and a new man is appointed. Further, there is no certainty that the appointee to fill the office of Assistant Secretary of Agriculture will in every case be a man of broad scientific opinions and able to satisfactorily supervise the work of the scientific divisions.

The great necessity for the existence of an officer of broad attainments, whose term of office would not be limited, and who could act in an advisory and controlling manner, becomes at once apparent. There are at present in the Department two large Bureaus, namely, The Weather Bureau and the Bureau of Animal Industry, and eight divisions engaged in purely scientific work. Of the two thousand men employed in the Agricultural Department, nine hundred and ninety-three are engaged chiefly in scientific and technical work. And of the \$2,400,000 appropriated annually, \$1,700,000 is appropriated for work of this class.

In view of the evident desirability of legislation in the direction indicated, an amendment to the appropriation bill was introduced in the United States Senate, May 13, 1896, and was referred to the Committee on Agriculture and Forestry. It received a favorable report from the Committee, but no action was taken by the Senate on account of the approaching close of the session. It is hoped that favorable action may be reached during the next session of Congress, and to this end it is proposed to submit to Congress the opinions of prominent individuals and scientific organizations. The proposition has been warmly approved by the following persons and organizations: President Gilman and the Scientific Faculty of Johns Hopkins University. President Dwight and the Scientific Faculty of Yale. Seventeen members of the Scientific Faculty of the University of Michigan. President Elliott and Prof. Shaler, of Harvard. Presidents Schurman, of Cornell; Low, of Columbia; Warren, of Boston; Walker, of the Massachusetts Institute of Technology; Hall, of Clark; Canfield, of Ohio; MacLean, of Nebraska; Chaplin, of Washington (St. Louis), and many other heads of colleges, directors of agricultural experiment stations, members of scientific faculties, various academies of science and scientific societies, the Joint Commission of the Scientific Societies of Washington, Mr. Theodore Roosevelt, and other gentlemen identified with the cause of Civil Service Reform.

In view, therefore, of the obvious good to the cause of science which will result from this proposed legislation, and in view of the practically unanimous endorsement which it has received from prominent educators and men of science throughout the country, and in further view of the fact, which is none the less

true although it has not been publicly mentioned, that this movement is in the direction of the coordination of scientific work under the general government, it seems to your Committee that the American Association for the Advancement of Science can unhesitatingly approve.

Your Committee, therefore, recommends that the Council recommend to the Association the adoption of the following resolution :

Resolved, That the American Association for the Advancement of Science heartily approves the proposition to create the office of Director-in-Chief of Scientific Bureaus and Investigations in the Department of Agriculture, to be filled by a broadly educated and experienced scientific man, provided that such appointment shall be made only on the nomination of the National Academy of Science, the legally constituted adviser of the Government in matters relating to science.

L. O. HOWARD,
Committee.

A communication with reference to the proposed vivisection laws was referred to a committee which presented the following report, which was unanimously adopted:

The American Association for the Advancement of Science, at its annual meeting held at Buffalo, August 24th to 28th, 1896, desires to present to the Congress of the United States its protest against legislation on the subject of vivisection. The membership of this Association is composed of experts and authorities and persons interested in different branches of science, in all numbering nearly two thousand. These members come from all parts of the country and represent many diverse interests.

WHEREAS, This Association was organized for the purpose of advancing science, of diffusing scientific information and exciting widespread interest on the part of the public in scientific progress; therefore, be it

Resolved, That this Association deprecates any legislation on the part of the government which would tend in the slightest degree to discourage the advancement of science, more especially biological, chemical and medical science, at this time when greater results are promised than ever before in the history of the world. And

WHEREAS, The health and welfare of men and animals are vitally affected by the results of animal experiments, and such experiments have effected a saving of many millions of dollars in animal property, and are the basis of our knowledge of hygiene and preventive medicine, and, in part, of surgery ; therefore, be it

Resolved, That while deprecating cruelty and needless vivisection experiments in the public schools,

this Association believes that those who are trained in biological research are the ones who are best able to decide as to the wisdom and utility of animal experimentation and deems that the legislation contemplated by Senate Bill 1552 would be unwise and would tend to retard the increase of knowledge of the means of mitigation of the sufferings of men and animals.

EDWARD D. COPE,
L. O. HOWARD,
Committee.

A communication asking that some steps be taken by the Association to secure the study of the white race in America was referred to Section H, with a request that a committee be nominated to consider the matter. The section reported the following names and the committee was so constituted: D. G. Brinton, J. McK. Cattell, W. W. Newell, W. J. McGee, Franz Boas.

A resolution regarding the proper designation of the vice-presidents was referred to a committee consisting of T. C. Mendenhall, F. P. Whitman and L. O. Howard, and upon their recommendation the Council instructed the permanent secretary to use the term *vice-president* in official publications in expressing the relation of the presiding officer of any section to the Association, and the term *chairman* in expressing his relation to the section, the term vice-president preceding the name and chairman following it when both relations are to be expressed. When referred to they are to be called vice-presidents *for* the sections, not *of* the sections.

The Committee on Grants recommended the following which were authorized by the Council: To the Marine Biological Laboratory, Woods Holl, Mass., for a table (appointment to be made by the vice-presidents for Sections F and G and the director of the laboratory), \$100; to Francis E. Phillips for investigations on the properties of natural gas, \$50; to L. A. Bauer for investigations on terrestrial magnetism in connection with the magnetic survey of Maryland, \$50.

At the request of the National Educational Association a committee was appointed to cooperate with committees from the N. E. A., with a view to unifying the requirements in science in secondary schools. The committee named by the Council consists of Profs. R. S. Tarr, H. S. Carhart, A. S. Packard, C. F. Mabery and C. E. Bessey.

Upon the recommendation of Section F, Prof. A. S. Packard was appointed a member of the American Advisory Board on Zoological Names.

Upon the recommendation of Section E, the following were named as delegates to the International Geological Congress at St. Petersburg in 1897, with power to fill any vacancy by a majority vote: E. D. Cope, James Hall, B. K. Emerson, W. N. Rice, C. D. Walcott.

A communication from the American committee upon the proposed monument to Pasteur in Paris was read to the Association, with the statement that the funds of the Association did not warrant an appropriation. The next day the permanent secretary received a check for \$100 from the generous patron of the Association, Mrs. Esther Herrmann, requesting that it be sent as the gift of the A. A. A. S. The treasurer was authorized to receive and transmit other gifts in the same way.

The officers of Section C were authorized to confer with those of the American Chemical Society in arranging the program of the next meeting. It is understood that the first two days of the meeting will be officially the meeting of the American Chemical Society, but that opportunity will be given for the proper organization of the section and the vice-president's address. The courtesy of reading papers before Section C is to be extended to members of the A. C. S. and *vice versa*. Similar arrangements were authorized between Section E and the Geological Society of America.

The Committee on the Policy of the As-

sociation has been active in considering steps for its further invigoration. Changes in the form and matter of the volume of proceedings, the relation of the affiliated societies, and a number of constitutional amendments permitting greater flexibility in transacting business and arranging for meetings were under consideration by the Council on recommendation by this committee, and it seems likely that some important advances will be made in the near future.

The place of meeting for 1897 and the relation of the Association to the Toronto meeting of the British Association was found a difficult problem. The invitations for 1897 from Indianapolis, Nashville, Columbus, Detroit, Minneapolis, Seattle, San Francisco, Denver and Toronto were all early placed in the hands of a sub-committee consisting of Professors Carhart, Mendenhall and Galbraith for consideration. Representatives of both Nashville and Toronto were present. This committee reported to the Nominating Committee, which debated the question for two hours, finally determining by about a two-thirds majority upon the following recommendation, which was presented to the Association:

The Committee recommend that the meeting for 1897 be only a formal meeting, that it be held in Toronto on August 17th of that year, and that the Association join in welcoming the British Association for the Advancement of Science to the continent of America.

The recommendation was vigorously opposed and after a two hours' debate was amended so as to require the meeting for 1897 to be a regular meeting, the time and place of which was left to the discretion of the Council.

The officers elected for the next meeting are :

PRESIDENT.

WOLCOTT GIBBS, of Newport, R. I.

VICE-PRESIDENTS.

A. *Mathematics and Astronomy*—W. W. BEMAN, of Ann Arbor, Mich.

- B. Physics*—CARL BARUS, of Providence, R. I.
C. Chemistry—W. P. MASON, of Troy, N. Y.
D. Mechanical Science and Engineering—JOHN GALBRAITH, of Toronto, Canada.
E. Geology and Geography—I. C. WHITE, of Morgantown, W. Va.
F. Zoology—G. BROWN GOODE, of Washington, D. C.
G. Botany—GEORGE F. ATKINSON, of Ithaca, N. Y.
H. Anthropology—W. J. MCGEE, of Washington, D. C.
I. Social and Economic Science—RICHARD T. COLBURN, of Elizabeth, N. J.

PERMANENT SECRETARY.

F. W. PUTNAM, of Cambridge, Mass. (Office, Salem, Mass.)

GENERAL SECRETARY.

ASAPH HALL, JR., of Ann Arbor, Mich.

SECRETARY OF THE COUNCIL.

D. S. KELLCOTT, of Columbus, Ohio.

SECRETARIES OF THE SECTIONS.

- A. Mathematics and Astronomy*—JAMES MCMAHON, of Ithaca, N. Y.
B. Physics—FREDERICK BEDELL, of Ithaca, N. Y.
C. Chemistry—P. C. FREER, of Ann Arbor, Mich.
D. Mechanical Science and Engineering—JOHN J. FLATHER, of LaFayette, Ind.
E. Geology and Geography—C. H. SMYTH, JR., of Clinton, N. Y.
F. Zoology—C. C. NUTTING, of Iowa City, Iowa.
G. Botany—F. C. NEWCOMBE, of Ann Arbor, Mich.
H. Anthropology—HARLAN I. SMITH, of New York, N. Y.
I. Social and Economic Science—ARCHIBALD BLUE, of Toronto, Canada.

TREASURER.

R. S. WOODWARD, of New York, N. Y.

CHARLES R. BARNES,
General Secretary.

MADISON, WIS.

BOTANICAL GARDENS.*

ORIGIN AND DEVELOPMENT.

THE cultivation of plants within small areas for their healing qualities by the monks of the middle ages appears to have

* Vice-Presidential address before Section G, American Association for the Advancement of Science, Buffalo, N. Y., August 24, 1896.

been the beginning of the modern botanical garden, although these mediæval gardens doubtless took their origin from others of greater antiquity. Botanical gardens were thus primarily formed for purely utilitarian purposes, although the æsthetic study of planting and of flowers must doubtless have appealed to their owners and visitors. Their function as aids in scientific teaching and research, the one which at present furnishes the dominating reason for their existence, did not develop much, if at all, before the 16th century, and prior to the middle of the 17th century a considerable number existed in Europe, in which this function was recognized to a greater or less degree, of which those at Bologna, Montpellier, Leyden, Paris and Upsala were, perhaps, the most noteworthy. The ornamental and decorative taste for planting had meanwhile been slowly gaining ground, as well as the desire to cultivate rare or unusual species, and during the 18th century attained a high degree of development. Many persons of wealth and influence fostered this taste and became, through the employment of men skilled in botany and horticulture, generous patrons of science. The world was searched for new and rare plants, which were brought home to Europe for cultivation, and many sumptuous volumes, describing and delineating them, were published, mainly through the same patronage. The older gardens were essentially private institutions, but as the rights of the people became more and more recognized, many existing establishments and an increasing number of newly founded ones became, to a greater or less extent, open to the public, either through an admittance fee or without charge. The four main elements of the modern botanical garden have thus been brought into it successively :

1. The utilitarian or economic.
2. The æsthetic.